99V-010

Spartan Motors Chassis Inc.
1000 Reynolds Road ♦ Charlotte MI 48813

April 24, 2000

National Highway Traffic Safety Administration
Office of Defect Investigation
400 Seventh Street, S.W.
Washington, DC 20590

Attn: Mrs. Pat Wallace

Dear Mrs. Wallace:

Enclosed please find a copy of TSB00-0401, which addresses a condition that may exist in regard to our Recall Service Bulletin RSB99V-010 or RSB99V-010A.

A copy of this bulletin will be forwarded to all Spartan service centers by our Customer Service Department. Please contact us if you require additional information.

Sincerely,

Kimberly Boucher

Kimberly Boucher
Compliance Coordinator

Compliance Group ♦ Plant 3
Phone: (517) 543-6400 ♦ Fax: (517) 543-7729

Spartan Motors Chassis, Inc.

1000 Reynolds Road ♦ Charlotte MI 48813

TECHNICAL SERVICE BULLETIN

SUBJECT:

Fire Trucks with DDEC (Detroit Diesel) Engine AND Involved in Recall Campaign #RSB 99V-010 or #RSB 99V-010A.

This bulletin addresses a condition that may exist following completion of the #RSB 99V-010A or RSB 99V-010 bulletin procedure.

APPLIES TO:

1994-1997 Fire Trucks with a DDEC (Detroit Diesel) Engine **AND** Involved in Recall Campaign #RSB 99V-010 or #RSB 99V-010A.

CONDITION:

'Engine' and 'Check Engine' Warning Lights Illuminate When Battery Master Switch is Turned On and Then Turned Off; May also experience 'Engine Run-On'.

CAUSE:

Voltage Signal Present at the Engine ECU Causing Activation of the ECU "Wake-Up" Signal.

CORRECTION:

Perform wiring rework to prevent voltage transmission.

SERVICE PROCEDURE:

Install relay block and perform wiring rework. Necessary to remove ignition panel.

PARTS LIST:

QTY	Part Number	Description
1	000401	Kit- FT DDEC Wiring Rework

PARTS LIST (cont.):

QTY	Part Number	Description
Kit # 000401 Contains:		
1	12033871	Connector Block
1	0636-GG5-A20	3/8" Eyelet
1	0636-GG5-A05	#10 Eyelet
1	12033871	Connector Block
1	0636-GG5-A20	3/8" Eyelet
1	0636-GG5-A05	#10 Eyelet
2	0940-GG5-014	Wire- 14 Ground (2 ft.)
2	0940-GG5-66S	Wire- 66 Acc Pwr (2 ft.)
4	0636-GG5-B21	Terminal
1	12033872	Secondary Lock
1	0121-GG3-006	Relay
0.5	0740-GG5-E03	Wire- 14 (1/2 ft.)
1	TSB00-0401	Bulletin Instructions
1	0120-GG5-823 Rev.A	Print- Wiring Diagram

Step by step instructions:

It will be necessary to reference the relay block configuration from document #RSB99-V-010 or RSB99-V-010A. Please read this entire bulletin prior to initiating any work.

1. Chock wheels.
2. With the cab stationary (NOT tilted), disconnect the batteries.
3. Locate the relay block, previously installed at the plenum (per RSB99-V-010 or RSB99-V-010A).
4. Remove secondary lock and relay from installed relay block.
5. De-pin circuit #DD440 from cavity #30 of the installed relay block.
6. Pin the #DD440 circuit (de-pinned from installed relay in step #5) into cavity #30 of the (new) relay provided in kit #000401.

   Note: Relay and secondary lock should be removed from the new relay block prior to pinning. Refer to FIG. 4-1.

7. Pin the pre-terminated end of the white wire into cavity #30 of the installed (old) relay block.

   Note: The opposite end of the white wire is pinned into cavity #87 of the new relay block.

8. Reinstall the relay and secondary lock into the installed relay block.

9. Disassemble ignition panel as necessary to gain access to the ignition switch posts.

10. Install the 66 circuit wire, from kit #000401, to post #1 of the ignition switch.

11. Attach new relay block to the installed relay block.

    Note: It may be necessary to remove the installed relay block to lock the new and old blocks together.

12. Install the relay into the new relay block and insert secondary lock.

13. Remove the self-tapping screw, which attaches the 14 ground wire from the old relay to the plenum. Retain screw for reinstallation in the next step.

14. Attach the 14 ground wire (with #10 eyelet) of the old relay, and the 14 ground wire (with #10 eyelet) of the new relay, to the plenum at the existing hole using the screw removed in step #13. Refer to attached wiring diagram in drawing #0120-GG5-823 Rev. A.

15. Reassemble ignition panel.

16. Verify operation by testing the function of the cab tilt system as described in the following steps:

    16a. Ensure the park brake is set, cab is empty of all occupants, and the ignition AND master switches are in the "OFF" position. Attempt to tilt the cab using the tilt control. The cab tilt should NOT operate.

    16b. Ensure the park brake is set, cab is empty of all occupants, the ignition switch is in the "OFF" position, and the master switch is in the "ON" position. Attempt to tilt the cab using the tilt control. The cab tilt should operate.

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16c. Ensure the park brake is set, cab is empty of all occupants, and the master and ignition switches are in the "ON" positions. Initiate the cab tilt function to raise the cab. The cab should NOT raise, but can be lowered.

16d. Ensure wheels are chocked. Repeat steps 16a-16c with the park brake released. The cab tilt system should NOT function under any of these conditions.

17. If all tests are successful, no further action is required. If any of the tests fail, review the procedures in the document #RSB99V-010 or #RSB99V-010A to verify the cab tilt repair procedure has been completed properly, and review the procedures in this bulletin for accurate application. Contact Spartan Motors Customer Assistance Center if any assistance is needed, 1-800-543-5008.

ADDITIONAL (NEW) RELAY BLOCK ASSEMBLY CONFIGURATION

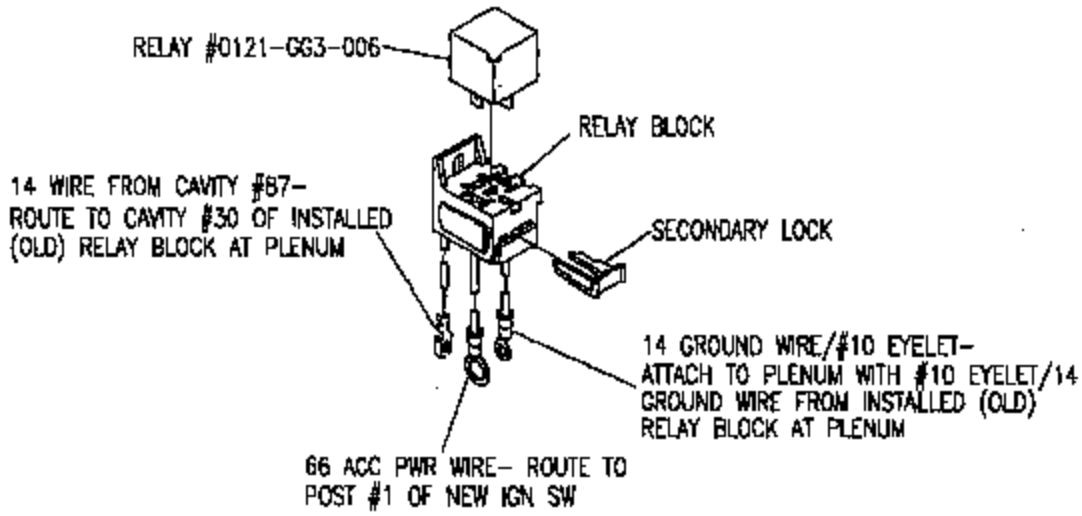
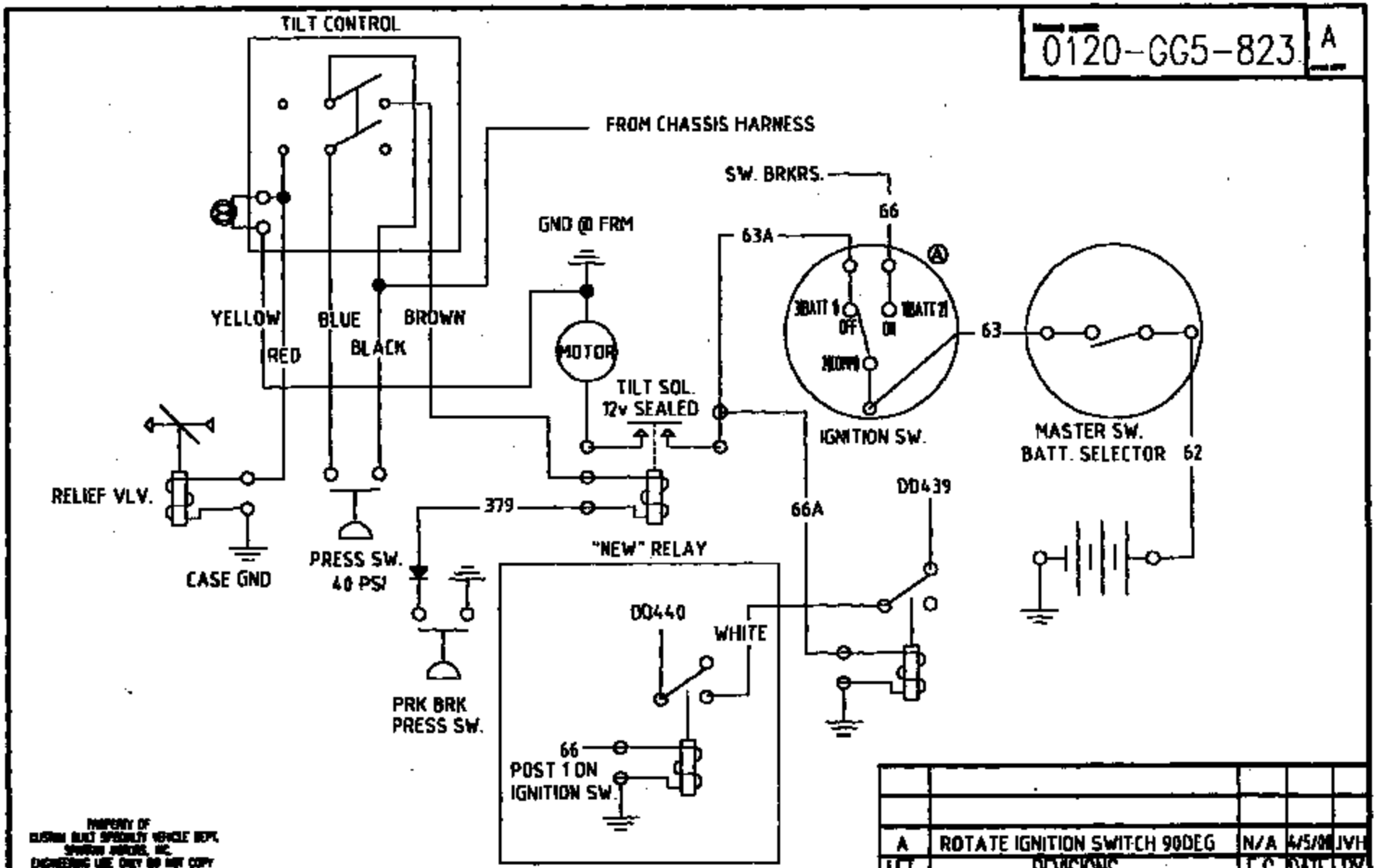


FIG. 4-1



0120-GG5-823 A

LET.	REVISIONS	E.C.	DATE	BY
A	ROTATE IGNITION SWITCH 90DEG	N/A	4/5/00	JVH

PROPERTY OF
CUSTOM BUILT SPECIALTY VEHICLE DEPT.
SPARTAN MOTORS, INC.
ENGINEERING USE ONLY DO NOT COPY
DATE ISSUED 11/17

Spartan Motors Inc.
WORLD WIDE VEHICLES AND CHASSIS
CHARLOTTE MICHIGAN 48813
ELECTRICAL ENGINEERING DEPT.

DRAWN BY SAK
DATE 11/17/99

WIRE DIAG- SUPPLIMENT TO RSB 99V-010 CAB TILT

REFERENCE E.C. NO.
REFERENCE S.O. NO.
MUST MEET FEDERAL SPEC.

0120-GG5-823 A

Spartan Motors Chassis, Inc.
1000 Reynolds Road • Charlotte MI 48813

RECALL SERVICE BULLETIN

SUBJECT:

Cab Tilt Solenoid Failure

APPLIES TO:

Fire Trucks with Tilt Cab System: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

CONDITION:

Unexpected Elevation of the Cab

CAUSE:

Cab Tilt System is Not Sufficiently Protected From the Elements

CORRECTION:

Install Cab Tilt System Upgrade Kit

SERVICE PROCEDURE:

Labor Time: 3.5 Hours

Install new ignition switch and cab tilt solenoid. Perform wiring rework as required.

PARTS LIST:

QTY	Part Number	Description
1	97019	Kit – Cab Tilt Update (contents listed on attachment #CT-0001)

RECOMMENDED TOOLS:

1	8913440	Crimpers / Packard Tool
1	169400	AMP® Crimper w/ #169403 Die Set

Step by step instructions:

REFER TO FIG. 13-1.

Due to the broad application of this bulletin, a common kit has been assembled to satisfy several conditions. Please dispose of any unused parts. Please contact Spartan Motors Chassis, Inc. if there are deviations to the content described in this bulletin.

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1. Chock wheels.

2. With the cab stationary (NOT tilted), disconnect the batteries.

3. Remove screws from the ignition panel, the main cluster, and from the park brake panel. The number of attachment screws may differ depending on design. Retain fasteners for re-installation.

4. Remove screw, lock washer, and paddle from the ignition switch and dispose of properly.

5. Pull out ignition/master switch panel to expose cable connections on the back of the ignition switch.

6. If the vehicle has a DDEC (Detroit Diesel Electronic Controlled) engine, proceed to step #25.

NON-DDEC ENGINE

7. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

8. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 3-1); retain for re-installation.

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

9. Refer to FIG. 3-1 to install new ignition switch. Locate star washer from the kit provided.

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10. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.

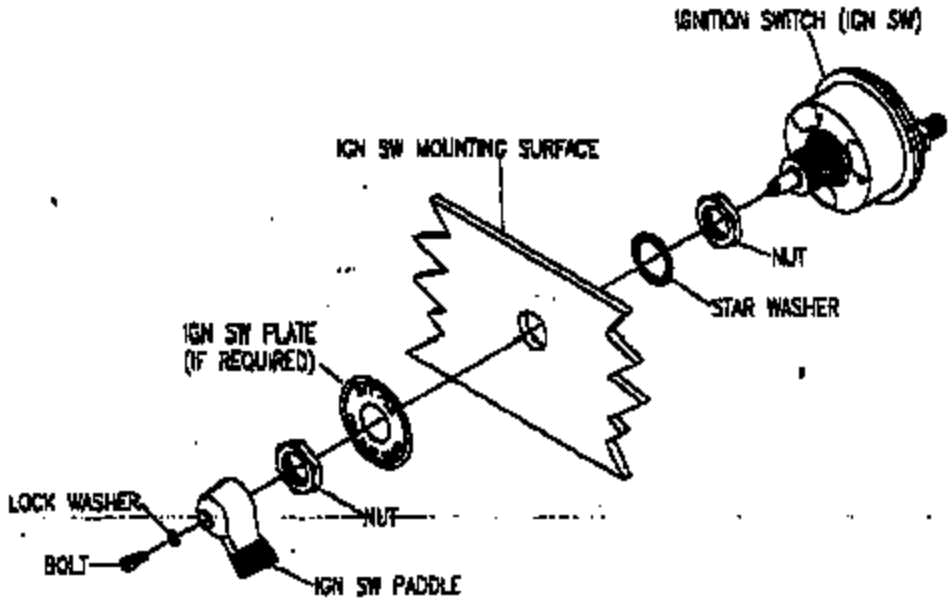

FIG. 3-1

11. Secure nut on the front of the panel.

12. Obtain new paddle and lock washer from kit and loosely install on the new switch.

NOTE: Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

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13. Secure paddle in place by tightening screw/lock washer.

14. Remove the cable from the master switch that had previously been connected to the ignition switch. Dispose of properly.

15. Using the cable #0885-GG5-2SC004 (4.0" long), make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: The new 4.0" cable must be oriented in a "U" shape curving downward toward the floor.

15A) **For Single Start Vehicles:** Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

15B) **For Dual Start Vehicles:** Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

16. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

17. Locate the remaining wire(s) that were removed from the "old" ignition switch and install them to the #1 post of the new ignition switch.

18. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

19. Remove the left (driver's side) upper headlamp assembly.

20. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-2SL300), down through the headlamp opening until approximately 36" is left outside the hole.

21. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

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22. Feed the loomed #379 circuit wire through the headlamp cutout until approximately 36" is left out.

23. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

24. Proceed to step #62.

DDEC ENGINE: RELAY BLOCK INSTALL (REFER TO FIG. 5-1)

25. Check the ignition switch for number and sizes of the posts. If the switch has ONLY 2- (two) 3/8" posts, return to step #7 and follow the "Non-DDEC" procedure.

26. Obtain relay/block sub-assembly from kit.

27. Remove relay and secondary lock from the block.

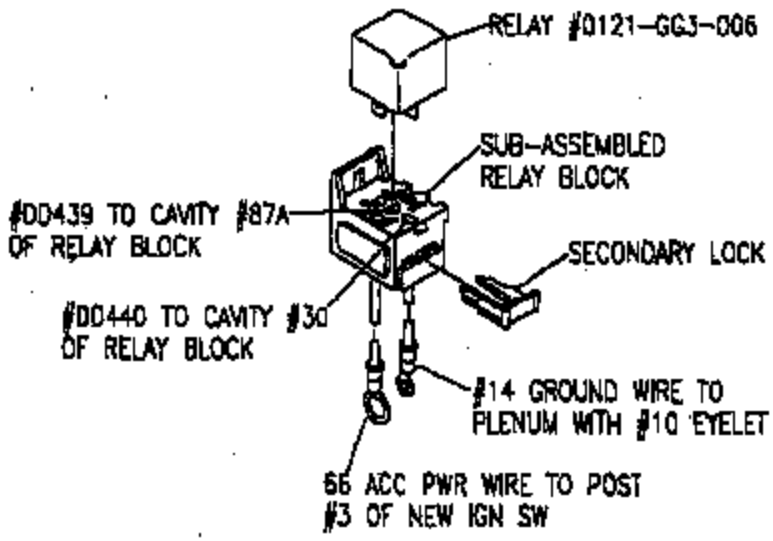

FIG. 5-1

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28. Disconnect the #DD440 circuit from the back of the ignition switch.

29. Remove the ring terminal from the #DD440 circuit wire and crimp on female Packard terminal.

30. Insert the #DD440 circuit in cavity #30 of the relay block.

31. Disconnect the #DD439 circuit from the back of the ignition switch.

32. Remove ring terminal from the #DD439 circuit wire and crimp on female Packard terminal.

33. Insert the #DD439 circuit in cavity #87A of the relay block.

34. Snap white secondary lock back into the relay block.

35. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one- (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

36. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 3-1); retain for re-installation.

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

37. Refer to FIG. 3-1 to install new ignition switch. Locate star washer from the kit provided.

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38. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.

39. Secure nut on the front of the panel.

40. Obtain new paddle and lock washer from kit and loosely install on the new switch.

NOTE: Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

41. Secure paddle in place by tightening screw/lock washer.

42. Remove the cable from the master switch that had previously connected the ignition switch to the master switch (old circuit #63). Dispose of properly.

43. Using the cable #0885-GG5-2SC004 (4.0" long), make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: The new 4.0" cable must be oriented in a "U" shape curving downward toward the floor.

43A) <u>For Single Start Vehicles:</u> Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

43B) <u>For Dual Start Vehicles:</u> Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

44. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

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45. Locate the remaining wire(s) that were removed from the "old" ignition switch (includes circuit #66) and install them to the #1 post of the new ignition switch.

46. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

47. Connect circuit #63A cable, and the 3/8" eyelet of circuit #66 wire from the relay block, to post #3 of the new ignition switch.

NOTE: There 2 (two) should be the only connections to post #3 of the ignition switch.

48. Tighten nut/lock washer on the #3 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

49. Remove the left (driver's side) upper headlamp assembly.

50. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-25L300), down through the headlamp opening until approximately 36" is left outside the hole.

51. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

52. Feed the loomed #379 circuit wire through the headlamp cutout until approximately 36" is left out.

53. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

AT THE PLENUM/DASH

54. Feed relay block through the ignition panel opening.

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55. Locate an area approximately 2.0" X 2.0" for mounting the relay block within reach of the wire length supplied.

56. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

57. Utilizing the pilot hole, mount the relay block with a self-tapping screw.

58. Install the relay into the mounted relay block and re-install secondary lock.

59. Prepare a .50" area on the plenum for mounting the eyelet by removing all paint around the location for mounting the ground eyelet.

NOTE: Eyelet mounting must be located within 24.0" of relay.

60. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

61. Secure the #10 eyelet, at the end of circuit #14, with a self-tapping screw in the new pilot hole.

COMMON DDEC/NON-DDEC PROCEDURES CONTINUED

62. Crimp male Packard terminal on cab end of circuit #379.

63. Snap on male Packard connector.

64. Snap on female end of diode to the male end of the #379 circuit.

65. Connect eyelet end of diode to the park brake switch located on the back of the park brake.

NOTE: If the park brake switch is a two-post design, add the connection to the "N/C" position identified on the back of the switch. A single-post switch will require attachment to the single post.

66. Re-install the ignition panel, park brake panel, and main gauge panel using the original hardware.

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67. Turn the master switch to the "OFF" position.

> **CAUTION:** Failure to place the master switch in the "OFF" position could cause sparks and/or shorts.

68. Replace headlamp module.

69. Re-connect batteries.

70. Tilt cab and ensure the cylinder support is in place prior to continuing.

AT THE CHASSIS

71. Route the circuit #379 wire and the circuit #63A cable around the pivot point and along the chassis following the existing harness(es).

NOTE: Secure with the 15" tie straps approximately every 24" until the lock downs are reached.

72. Follow the 3/O cable from the existing tilt solenoid back to the battery and disconnect from the battery.

73. Verify that the tilt function is disconnected by pressing the tilt control in lift position. Disconnect battery cable to the tilt solenoid if not already done. Repeat verification to ensure the tilt function is disabled.

74. Replace battery nut previously removed.

75. Disconnect and remove battery cable at the tilt solenoid. Dispose of cable properly.

76. Route circuit #63A cable under cab lock-down, following the path of the old cable to the pump solenoid.

77. Remove copper bar, white wire, yellow wire, and brown wire from the existing solenoid. Retain nut, from the removal of the copper bar, for re-installation.

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78. Remove existing solenoid and dispose of properly. Retain screws for re-installation.

79. Using a mounting screw, connect yellow wire and white #14 ground wire to one side of the solenoid mount and attach the assembly to the pump using existing mounting hole.

NOTE: The #14 white wire may not be present on some older models.

80. Attach the remaining mount to the pump with a mounting screw.

81. Attach the brown wire on either of the small posts of the solenoid.

82. Cut the #379 circuit wire to an appropriate length.

83. Crimp eyelet on to the #379 circuit (using AMP® approved crimpers).

84. Attach #379 circuit to the second of the two small posts on the solenoid (the one not occupied by the brown wire).

85. Secure #379 circuit in place with 7" tie straps as needed.

86. Check the circuit #63A" cable for the appropriate length to attach to either of the large solenoid posts.

NOTE: If the cable is too long, loop excess into frame rail ensuring the cable does not come into contact with the main driveshaft, the PTO driveshaft, or contact any other potential chaffing surfaces/edges.

87. Secure cable in frame rail using 15" straps.

88. Connect the circuit #63A cable to either of the large posts on the solenoid.

89. Connect 12.0" battery cable #0885-GG5-2RC012 to the unoccupied large post on the solenoid.

90. Connect the loose end of the 12.0" battery cable to the power post of the tilt motor (where copper bar was previously connected).

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91. To prevent undesired contact of cables/wires to other components, confirm that none of the new components exceed the height of the pump reservoir. Re-routing will be necessary if this condition exists.

92. Spray all pump terminals with terminal corrosion protector such as Krylon 1308 or equivalent.

93. Lift and release cylinder support to lower cab.

TEST PROPER FUNCTION OF CAB TILT SYSTEM

94. Ensure the park brake is set, cab is empty of all occupants, and the ignition AND master switches are in the "OFF" position. Attempt to tilt the cab using the tilt control. The cab tilt should NOT operate.

95. Ensure the park brake is set, cab is empty of all occupants, the ignition switch is in the "OFF" position, and the master switch is in the "ON" position. Attempt to tilt the cab using the tilt control. The cab tilt should operate.

96. Ensure the park brake is set, cab is empty of all occupants, and the master and ignition switches are in the "ON" positions. Initiate the cab tilt function to raise the cab. The cab should NOT raise, but can be lowered.

97. Ensure wheels are chocked. Repeat steps #91, #92, #93 with the park brake released. The cab tilt system should NOT function under any of these conditions.

98. If all tests are successful, this procedure is completed. If any of the tests fail, return to step #1 and repeat the repair procedure.

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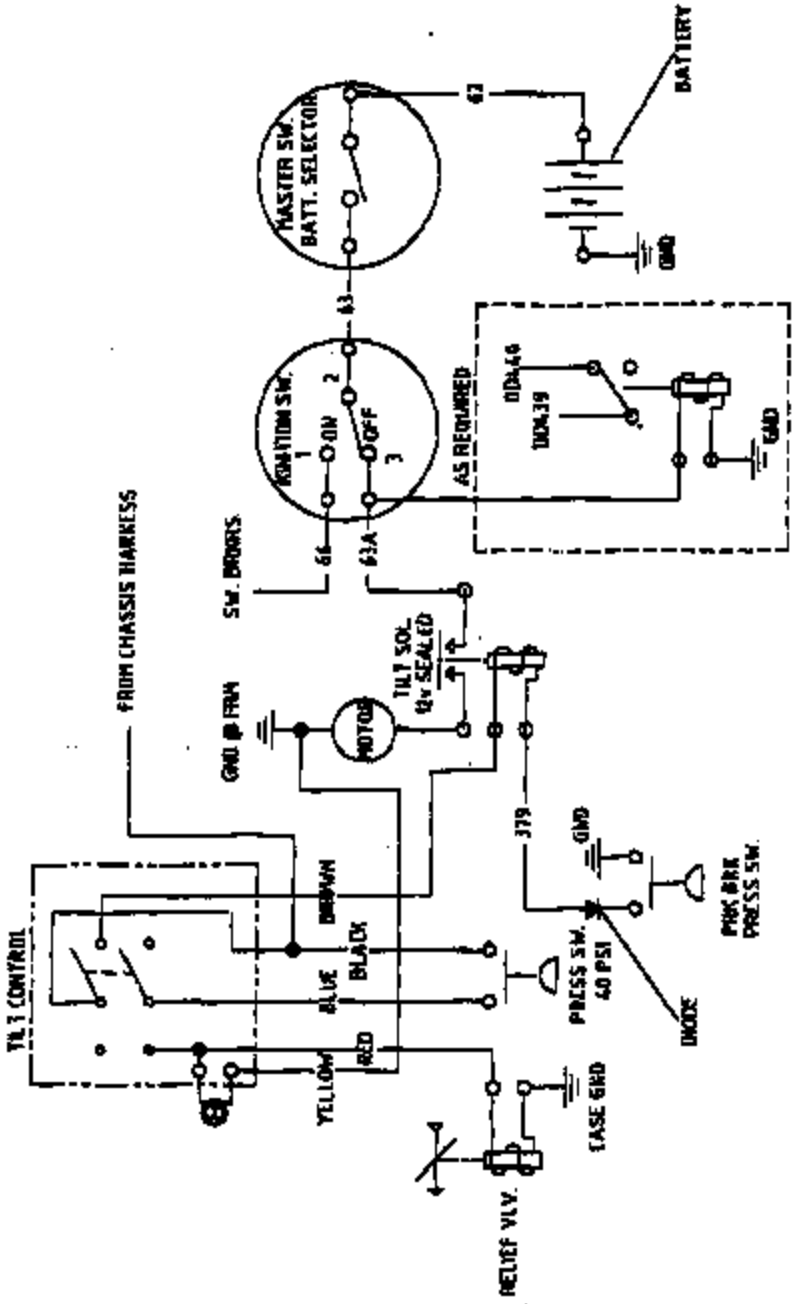
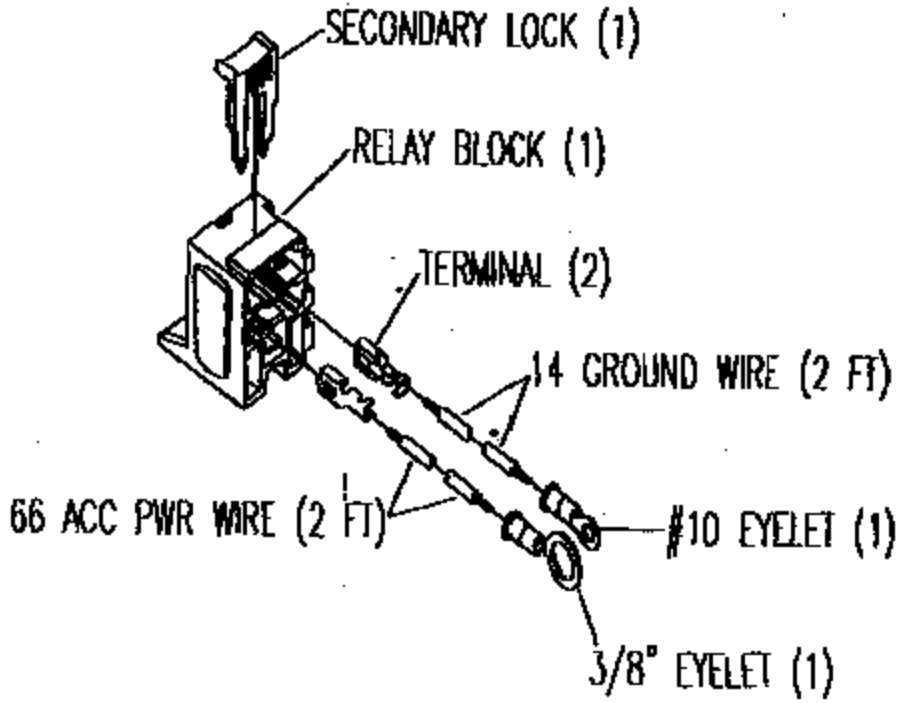


FIG. 13-1

RSB98-V-0010 CAB TILT SOLENOID FAILURE
(SPEC #97019)

PARTS LIST				KIT #97019
PART #	PART DESC.	QTY.	Illustration Reference / Comments	
			Relay Block Assembly	
12033871	Connector Block- F 5-way	1	Pre-Assemble at Spartan Motors	X
0636-GG5-A20	Eyelet- 3/8"	1	See Page 2- Sub-Assembly of Relay Block	X
0636-GG5-A05	Eyelet- #10	1		X
0640-GG5-014	Wire- 14 Ground (14awg) (2 feet)	2		X
0640-GG5-86S	Wire- 86 Acc Pwr (14 awg) (2 feet)	2		X
0636-GG5-B21	Terminal	2		X
0121-GG3-006	Relay- 12 volt, 40/30 Amp	1		X
12033872	Secondary Lock	1		X
10240060HWTCFZ	Self-tapping Screws	2		X
0134-GG3-024	Switch-Ignition	1	***LOCATING NUT GROUND OFF AT SPARTAN***	X
0685-GG5-2SL300	Cable- Ignition Switch to Tilt Solenoid	1	300 inches in length	X
0185-GG3-013	Solenoid-Cab Tilt	1		X
0685-G5-2RC012	Cable-Tilt Solenoid to Pump	1		X
0685-GG5-2SC004	Cable- Master Switch to Ignition	1		X
0636-GG5-B21	Terminal	2		X
0636-GG5-A05	Eyelet- #10	1		X
T120RO	Tie Straps- 15"	15		X
T3ORO	Tie Straps- 6"	7		X
0640-GG5-379	Wire- 14 awg "park brake"	25	300 inches in length	X
0636-GG5-J06	3/8" Loom	25	25 feet in length	X
8900420	Male Connector	1		X
0636-GG5-D02	Male Terminal	1		X
0172-GG3-005	Diode	1		X
89V-010	Bulletin Instructions	1		X
CT-0001	Part List	1		X

SUB-ASSEMBLY OF RELAY BLOCK
TO BE COMPLETED AT SPARTAN MOTORS



SPARTAN

S P A R T A N

March 26, 1999 **RSB99V-010**

Dear Service Manager:

Spartan Motors is recalling all Fire Trucks with Tilt Cab Systems: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

Reason: The Cab Tilt System, Not Sufficiently Protected from the Elements, Could Cause an Unexpected Elevation of the Cab.

We will contact all owners of these units that are affected by this recall. They will be provided with a list of Spartan Authorized Service Centers, including your facility. They will also be advised that they do not need to call Spartan Motors, but they should call the facility on the list that is nearest to them and make an appointment.

Replacement kits are available for installation. Instructions will be sent to you when the parts are ordered and shipped.

SCHEDULING THE WORK:

1. When the customer calls reporting receipt of a Recall Service Bulletin, schedule the work at your mutual convenience.

2. When the customer arrives for the appointment, ask him/her for his recall letter. You can use this to verify the chassis VIN.

3. It will be helpful to verify the "users" current address and phone number.

COMPLETING THE WORK:

1. **You do not need a work authorization number from Spartan Motors to complete this work.** There is no need to call Spartan customer service unless you need technical assistance.

2. Do the work following the instructions on the Recall Service Bulletin.

SPARTAN MOTORS, INC. • P.O. BOX 440 • 1000 REYNOLDS RD • CHARLOTTE, MI 48813 • USA
(517) 543-6400 • FAX (517) 543-7727

DOCUMENTING THE WORK:

1. Document your work on copies you have made of the enclosed "Record of Completion" or by providing the same information on your own invoice. This will satisfy both our need for documentation of the completed recall and our requirement for an invoice to reimburse for the work.

2. You will be reimbursed for **3.5 hours of labor time.**

3. If there are contributing factors that cause the recall procedure to take longer than the allotted time, please report that information on your shop repair order instead of the "Record of Completion", including details of the circumstances that resulted in additional time. Enter Recall **#RSB99V-010** as the work authorization number. The time for these repairs will be considered for reimbursement on a case by case basis.

4. Please submit the completed "Record of Completion" form as soon as the repairs are completed or once a week, whichever is most convenient. Mail these reports to:

   Warranty Administration Plant 4
   Spartan Motors, Inc.
   1000 Reynolds Rd.
   PO Box 440
   Charlotte, MI 48813

5. Submit collected copies of the owner letters with the "Record of Completion" forms. We would appreciate notation of the facility or address changes on the letter.

6. Documents submitted for Spartan reimbursement for this recall, whether "Record of Completion" or a repair order, should not be combined with any other documents being sent to Spartan.

HANDLING A "USER" WITH NO CONFIRMATION LETTER:

1. If you are contacted by a "user" who has not received a recall letter, you should verify that they have an affected cab tilt system and call Wayne Ridge at Spartan Motors (517-543-6400 ext.445) for verification.

2. Complete the work as instructed.

3. Record the vehicle VIN along with the "users" name, address and phone number on a copy you make of the enclosed "Report of Owner" form. Please fax this information, daily, to Warranty Administration at (517) 543-9264.

4. Document the work and submit the claim as instructed under the Documenting the Work section above.

PARTS SUPPLY & DISPOSITION:

1. The shipment of parts will be identified with the recall number. If you need additional parts, please order them by calling Howard Miller in Spartan Motors Service Parts at (517) 543-6400, ext. 212.

SPARTAN ASSISTANCE:

1. If you have technical questions, please call our Fire Truck Customer Service Department, at (800) 543-5008.

2. If you have questions about record keeping, returning parts or billing, call Wayne Ridge at (517) 543-6400, ext. 445.

Spartan Motors
Chassis, Inc.
1000 Reynolds Road ♦ Charlotte MI 48813

RECALL SERVICE BULLETIN

SUBJECT:

Cab Tilt Solenoid Failure

APPLIES TO:

Fire Trucks with Tilt Cab System: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

CONDITION:

Unexpected Elevation of the Cab

CAUSE:

Cab Tilt System is Not Sufficiently Protected From the Elements

CORRECTION:

Install Cab Tilt System Upgrade Kit

SERVICE PROCEDURE:

Labor Time: 3.5 Hours

Install new ignition switch and cab tilt solenoid. Perform wiring rework as required.

PARTS LIST:

QTY	Part Number	Description
1	97019	Kit – Cab Tilt Update (contents listed on attachment #CT-0001)

RECOMMENDED TOOLS:

1	8913440	Crimpers / Packard Tool
1	169400	AMP® Crimper w/ #169403 Die Set

Step by step instructions:

REFER TO FIG. 13-1.

Due to the broad application of this bulletin, a common kit has been assembled to satisfy several conditions. Please dispose of any unused parts. Please contact Spartan Motors Chassis, Inc. if there are deviations to the content described in this bulletin.

1. Chock wheels.

2. With the cab stationary (**NOT** tilted), disconnect the batteries.

3. Remove screws from the ignition panel, the main cluster, and from the park brake panel. The number of attachment screws may differ depending on design. Retain fasteners for re-installation.

4. Remove screw, lock washer, and paddle from the ignition switch and dispose of properly.

5. Pull out ignition/master switch panel to expose cable connections on the back of the ignition switch.

6. If the vehicle has a DDEC (Detroit Diesel Electronic Controlled) engine, proceed to step #25.

NON-DDEC ENGINE

7. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one- (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

8. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 3-1); retain for re-installation.

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

9. Refer to FIG. 3-1 to install new ignition switch. Locate star washer from the kit provided.

10. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.

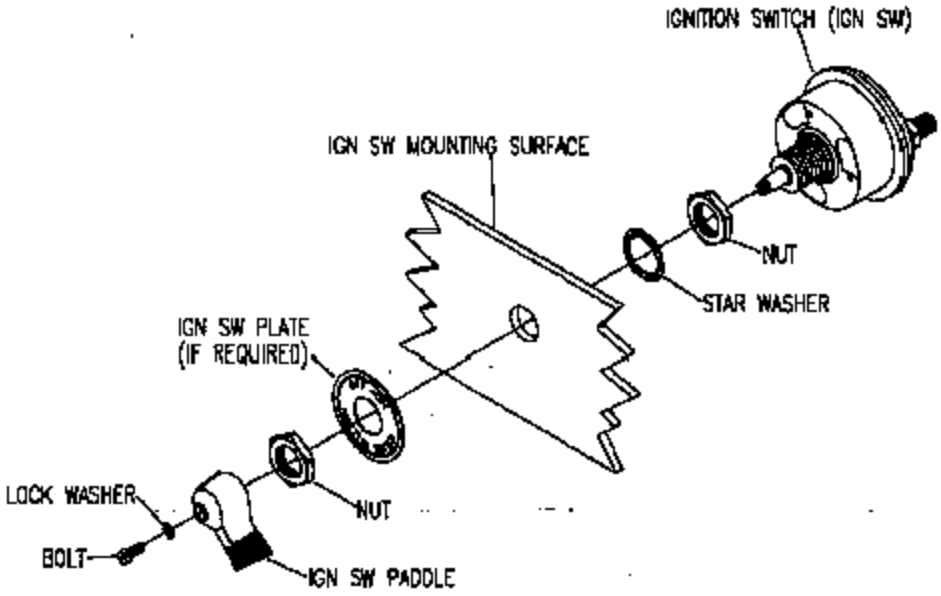


FIG. 3-1

11. Secure nut on the front of the panel.

12. Obtain new paddle and lock washer from kit and **loosely** install on the new switch.

NOTE: Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

13. Secure paddle in place by tightening screw/lock washer.

14. Remove the cable from the master switch that had previously been connected to the ignition switch. Dispose of properly.

15. Using the cable #0885-GG5-2SC004 (4.0" long), make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: The new 4.0" cable must be oriented in a "U" shape curving downward toward the floor.

15A) **For Single Start Vehicles:** Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

15B) **For Dual Start Vehicles:** Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

16. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

17. Locate the remaining wire(s) that were removed from the "old" ignition switch and install them to the #1 post of the new ignition switch.

18. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

19. Remove the left (driver's side) upper headlamp assembly.

20. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-2SL300), down through the headlamp opening until approximately 36" is left outside the hole.

21. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

22. Feed the loomed #379 circuit wire through the headlamp cutout until approximately 36" is left out.

23. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

24. Proceed to step #62.

DDEC ENGINE: RELAY BLOCK INSTALL (REFER TO FIG. 5-1)

25. Check the ignition switch for number and sizes of the posts. If the switch has ONLY 2- (two) 3/8" posts, return to step #7 and follow the "Non-DDEC" procedure.

26. Obtain relay/block sub-assembly from kit.

27. Remove relay and secondary lock from the block.

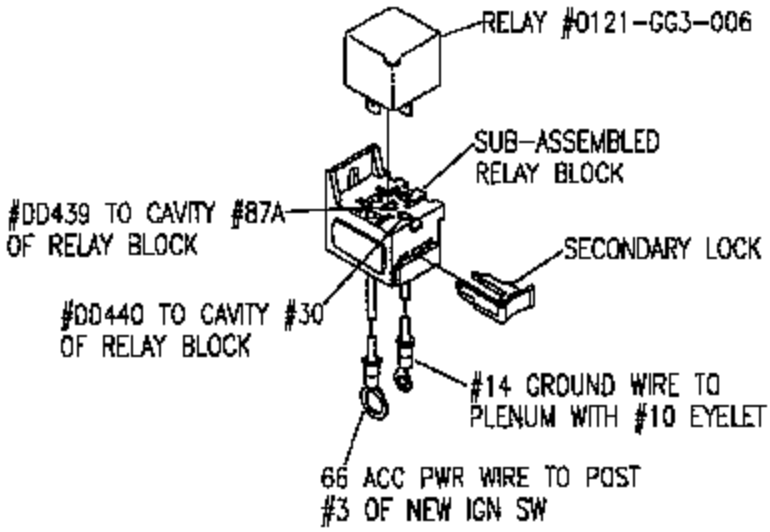


FIG. 5-1

28. Disconnect the #DD440 circuit from the back of the ignition switch.

29. Remove the ring terminal from the #DD440 circuit wire and crimp on female Packard terminal.

30. Insert the #DD440 circuit in cavity #30 of the relay block.

31. Disconnect the #DD439 circuit from the back of the ignition switch.

32. Remove ring terminal from the #DD439 circuit wire and crimp on female Packard terminal.

33. Insert the #DD439 circuit in cavity #87A of the relay block.

34. Snap white secondary lock back into the relay block.

35. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one- (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

36. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 3-1); retain for re-installation.

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

37. Refer to FIG. 3-1 to install new ignition switch. Locate star washer from the kit provided.

38. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.

39. Secure nut on the front of the panel.

40. Obtain new paddle and lock washer from kit and **loosely** install on the new switch.

NOTE: Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

41. Secure paddle in place by tightening screw/lock washer.

42. Remove the cable from the master switch that had previously connected the ignition switch to the master switch (old circuit #63). Dispose of properly.

43. Using the cable #0885-GG5-2SC004 (4.0" long), make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: The new 4.0" cable must be oriented in a "U" shape curving downward toward the floor.

43A) <u>For Single Start Vehicles:</u> Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

43B) <u>For Dual Start Vehicles:</u> Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

44. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

45. Locate the remaining wire(s) that were removed from the "old" ignition switch (includes circuit #66) and install them to the #1 post of the new ignition switch.

46. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

47. Connect circuit #63A cable, and the 3/8" eyelet of circuit #66 wire from the relay block, to post #3 of the new ignition switch.

NOTE: These 2 (two) should be the only connections to post #3 of the ignition switch.

48. Tighten nut/lock washer on the #3 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

49. Remove the left (driver's side) upper headlamp assembly.

50. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-2SL300), down through the headlamp opening until approximately 36" is left outside the hole.

51. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

52. Feed the loomed #379 circuit wire through the headlamp cutout until approximately 36" is left out.

53. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

AT THE PLENUM/DASH

54. Feed relay block through the ignition panel opening.

55. Locate an area approximately 2.0" X 2.0" for mounting the relay block within reach of the wire length supplied.

56. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

57. Utilizing the pilot hole, mount the relay block with a self-tapping screw.

58. Install the relay into the mounted relay block and re-install secondary lock.

59. Prepare a .50" area on the plenum for mounting the eyelet by removing all paint around the location for mounting the ground eyelet.

NOTE: Eyelet mounting must be located within 24.0" of relay.

60. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

61. Secure the #10 eyelet, at the end of circuit #14, with a self-tapping screw in the new pilot hole.

COMMON DDEC/NON-DDEC PROCEDURES CONTINUED

62. Crimp male Packard terminal on cab end of circuit #379.

63. Snap on male Packard connector.

64. Snap on female end of diode to the male end of the #379 circuit.

65. Connect eyelet end of diode to the park brake switch located on the back of the park brake.

NOTE: If the park brake switch is a two-post design, add the connection to the "N/C" position identified on the back of the switch. A single-post switch will require attachment to the single post.

66. Re-install the ignition panel, park brake panel, and main gauge panel using the original hardware.

67. Turn the master switch to the "OFF" position.

> **CAUTION:** Failure to place the master switch in the "OFF" position could cause shorts and/or sparks.

68. Replace headlamp module.

69. Re-connect batteries.

70. Tilt cab and ensure the cylinder support is in place prior to continuing.

AT THE CHASSIS

71. Route the circuit #379 wire and the circuit #63A cable around the pivot point and along the chassis following the existing harness(es).

NOTE: Secure with the 15" tie straps approximately every 24" until the lock downs are reached.

72. Follow the 3/O cable from the existing tilt solenoid back to the battery and disconnect from the battery.

73. Verify that the tilt function is disconnected by pressing the tilt control in lift position. Disconnect battery cable to the tilt solenoid if not already done. Repeat verification to ensure the tilt function is disabled.

74. Replace battery nut previously removed.

75. Disconnect and remove battery cable at the tilt solenoid. Dispose of cable properly.

76. Route circuit #63A cable under cab lock-down, following the path of the old cable to the pump solenoid.

77. Remove copper bar, white wire, yellow wire, and brown wire from the existing solenoid. Retain nut, from the removal of the copper bar, for re-installation.

78. Remove existing solenoid and dispose of properly. Retain screws for re-installation.

79. Using a mounting screw, connect yellow wire and white #14 ground wire to one side of the solenoid mount and attach the assembly to the pump using existing mounting hole.

NOTE: The #14 white wire may not be present on some older models.

80. Attach the remaining mount to the pump with a mounting screw.

81. Attach the brown wire on either of the small posts of the solenoid.

82. Cut the #379 circuit wire to an appropriate length.

83. Crimp eyelet on to the #379 circuit (using AMP® approved crimpers).

84. Attach #379 circuit to the second of the two small posts on the solenoid (the one not occupied by the brown wire).

85. Secure #379 circuit in place with 7" tie straps as needed.

86. Check the circuit #63A" cable for the appropriate length to attach to either of the large solenoid posts.

NOTE: If the cable is too long, loop excess into frame rail ensuring the cable does not come into contact with the main driveshaft, the PTO driveshaft, or contact any other potential chaffing surfaces/edges.

87. Secure cable in frame rail using 15" straps.

88. Connect the circuit #63A cable to either of the large posts on the solenoid.

89. Connect 12.0" battery cable #0885-GG5-2RC012 to the unoccupied large post on the solenoid.

90. Connect the loose end of the 12.0" battery cable to the power post of the tilt motor (where copper bar was previously connected).

91. To prevent undesired contact of cables/wires to other components, confirm that none of the new components exceed the height of the pump reservoir. Re-routing will be necessary if this condition exists.

92. Spray all pump terminals with terminal corrosion protector such as Krylon 1308 or equivalent.

93. Lift and release cylinder support to lower cab.

TEST PROPER FUNCTION OF CAB TILT SYSTEM

94. Ensure the park brake is set, cab is empty of all occupants, and the ignition AND master switches are in the "OFF" position. Attempt to tilt the cab using the tilt control. The cab tilt should NOT operate.

95. Ensure the park brake is set, cab is empty of all occupants, the ignition switch is in the "OFF" position, and the master switch is in the "ON" position. Attempt to tilt the cab using the tilt control. The cab tilt should operate.

96. Ensure the park brake is set, cab is empty of all occupants, and the master and ignition switches are in the "ON" positions. Initiate the cab tilt function to raise the cab. The cab should NOT raise, but can be lowered.

97. Ensure wheels are chocked. Repeat steps #91, #92, #93 with the park brake released. The cab tilt system should NOT function under any of these conditions.

98. If all tests are successful, this procedure is completed. If any of the tests fail, return to step #1 and repeat the repair procedure.

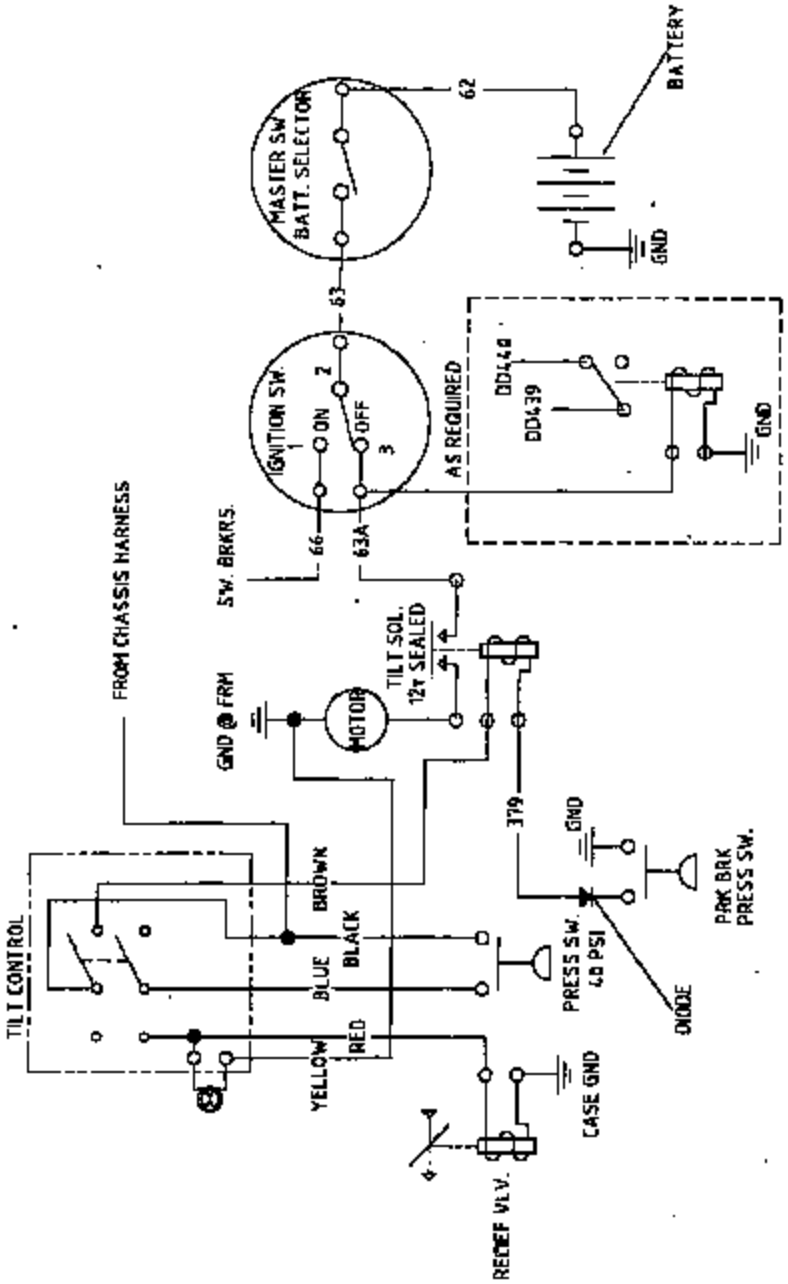
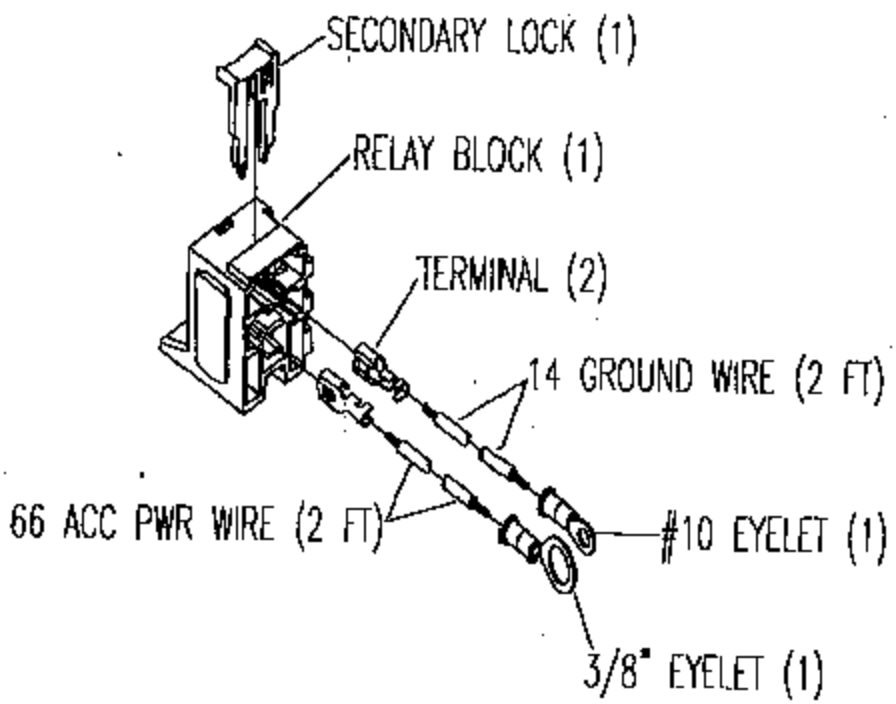


FIG. 13-1

RSB99-V-0010 CAB TILT SOLENOID FAILURE
(SPEC #97019)

PARTS LIST				KIT #97019
PART #	PART DESC.	QTY.	Illustration Reference / Comments	
			Relay Block Assembly	
12033871	Connector Block- F 5-way	1	**Pre-Assemble at Spartan Motors**	X
0636-GG5-A20	Eyelet- 3/8"	1	**See Page 2- Sub-Assembly of Relay Block**	X
0636-GG5-A05	Eyelet- #10	1		X
0940-GG5-014	Wire- 14 Ground (14awg) (2 feet)	2		X
0940-GG5-66S	Wire- 66 Acc Pwr (14 awg) (2 feet)	2		X
0636-GG5-B21	Terminal	2		X
0121-GG3-006	Relay- 12 volt, 40/30 Amp	1		X
12033872	Secondary Lock	1		X
10240050HWTCFZ	Self-tapping Screws	2		X
0134-GG3-024	Switch-Ignition	1	***LOCATING NUB GROUND OFF AT SPARTAN***	X
0665-GG5-26L300	Cable- Ignition Switch to Tilt Solenoid	1	300 inches in length	X
0185-GG3-013	Solenoid-Cab Tilt	1		X
0665-G5-2RC012	Cable-Tilt Solenoid to Pump	1		X
0665-GG5-26C004	Cable- Master Switch to Ignition	1		X
0636-GG5-B21	Terminal	2		X
0636-GG5-A05	Eyelet- #10	1		X
T120RO	Tie Straps- 15"	16		X
T30RO	Tie Straps- 6"	7		X
0940-GG5-379	Wire- 14 awg "park brake"	25	300 inches in length	X
0636-GG5-J06	3/8" Loom	25	25 feet in length	X
8900420	Male Connector	1		X
0636-GG5-D02	Male Terminal	1		X
0172-GG3-005	Diode	1		X
99V-010	Bulletin Instructions	1		X
CT-0001	Part List	1		X

SUB-ASSEMBLY OF RELAY BLOCK
TO BE COMPLETED AT SPARTAN MOTORS



SPARTAN

S P A R T A N

RSB99V-010

March 26, 1999

This notice is sent to you in accordance with the requirements of the National Traffic Motor Vehicle Safety Act.

Spartan Motors, Inc. has determined that a defect, which relates to motor vehicle safety, exists in:

Fire Trucks with Tilt Cab Systems: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

Safety Repairs Because the Cab Tilt System is Not Sufficiently Protected from the Elements, There Could be an Unexpected Elevation of the Cab.

Correction: Install Cab Tilt System Upgrade Kit.

These services must be performed at a Spartan authorized service center, at no charge to you. The old solenoid is to be discarded.

What You Should Do Call an authorized service center without delay. **You do not need to call Spartan Motors, Inc.** Find the facility most convenient to you on the enclosed list of Spartan Motors' authorized service centers and call that facility to make an appointment to have this recall implemented.

Labor Time The labor time necessary is approximately **3.5 hours** to install the new ignition switch and cab tilt solenoid. However, due to some service scheduling times, your service center may need your vehicle for a longer period.

Reply Card Please fill out the enclosed prepaid postcard and mail it to us if you have changed your address or sold or traded the vehicle.

SPARTAN MOTORS, INC. • P.O. BOX 440 • 1000 REYNOLDS RD • CHARLOTTE, MI 48813 • USA
(517) 543-6400 • FAX (517) 543-7727

If the authorized service center has failed or is unable to remedy the defect without charge and within a reasonable time, contact Spartan Motors at (800-543-5008). You may also submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street SW, Washington, DC 20590 or call the Auto Safety Hotline at 800-424-9393 (Washington DC area residents may call 202-355-0123).

We regret any inconvenience this service may cause you. Your safety and continued satisfaction with the quality and performance of your Spartan Motors Vehicle is of the utmost concern to us.

SPARTAN MOTORS INC.

June 18, 1999 **RSB99V-010**

Dear Service Manager:

Spartan Motors is recalling all Fire Trucks with Tilt Cab Systems: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

Reason: The Cab Tilt System, Not Sufficiently Protected from the Elements, Could Cause an Unexpected Elevation of the Cab, Increasing the Risk of Personal Safety.

We will contact all owners of these units that are affected by this recall. They will be provided with a list of Spartan Authorized Service Centers, including your facility. They will also be advised that they do not need to call Spartan Motors, but they should call the facility on the list that is nearest to them and make an appointment.

Replacement kits are available for installation. Instructions will be sent to you when the parts are ordered and shipped.

SCHEDULING THE WORK:

1. When the customer calls reporting receipt of a Recall Service Bulletin, schedule the work at your mutual convenience.

2. When the customer arrives for the appointment, ask him/her for his recall letter. You can use this to verify the chassis VIN.

3. It will be helpful to verify the "users" current address and phone number.

COMPLETING THE WORK

1. **You do not need a work authorization number from Spartan Motors to complete this work.** There is no need to call Spartan customer service unless you need technical assistance.

2. Do the work following the instructions on the Recall Service Bulletin.

P.O. Box 440 - 1600 Reynolds Rd. - Charlotte, MI 48813 - U.S.A.
Telephone 517-543-6400 - Fax 517-543-7237

DOCUMENTING THE WORK:

1. Document your work on copies you have made of the enclosed "Record of Completion" or by providing the same information on your own invoice. This will satisfy both our need for documentation of the completed recall and our requirement for an invoice to reimburse for the work.

2. You will be reimbursed for **3.5 hours of labor time.**

3. If there are contributing factors that cause the recall procedure to take longer than the allotted time, please report that information on your shop repair order instead of the "Record of Completion", including details of the circumstances that resulted in additional time. Enter Recall **#RSB99V-010** as the work authorization number. The time for these repairs will be considered for reimbursement on a case by case basis.

4. Please submit the completed "Record of Completion" form as soon as the repairs are completed or once a week, whichever is most convenient. Mail these reports to:

   Warranty Administration Plant 4
   Spartan Motors, Inc.
   1000 Reynolds Rd.
   PO Box 440
   Charlotte, MI 48813

5. Submit collected copies of the owner letters with the "Record of Completion" forms. We would appreciate notation of the facility or address changes on the letter.

6. Documents submitted for Spartan reimbursement for this recall, whether "Record of Completion" or a repair order, should not be combined with any other documents being sent to Spartan.

HANDLING A "USER" WITH NO CONFIRMATION LETTER:

1. If you are contacted by a "user" who has not received a recall letter, you should verify that they have an affected chassis and call Wayne Ridge at Spartan Motors (517) 543-6400, ext. 445 for verification.

2. Complete the work as instructed.

3. Record the vehicle VIN along with the "users" name, address and phone number on a copy you make of the enclosed "Report of Owner" form. Please fax this information, daily, to Warranty Administration at (517) 543-9264.

4. Document the work and submit the claim as instructed under the Documenting the Work section above.

PARTS SUPPLY & DISPOSITION:

1. The shipment of parts will be identified with the recall number. If you need additional parts, please order them by calling Howard Miller in Spartan Motors Service Parts at (517) 543-6400, ext. 212.

SPARTAN ASSISTANCE:

1. If you have **technical questions**, please call our Fire Truck Customer Service Department (800) 543-5008.

2. If you have questions about record keeping, returning parts or billing, call Wayne Ridge at (517) 543-6400, ext. 445.

SPARTAN MOTORS

INC.

RSB99V-018

June 18, 1999

This notice is sent to you in accordance with the requirements of the National Traffic Motor Vehicle Safety Act.

Spartan Motors, Inc. has determined that a defect, which relates to motor vehicle safety, exists in:

Fire Trucks with Tilt Cab Systems: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

Safety Repairs Because the Cab Tilt System is not sufficiently protected from the elements, there could be an unexpected elevation of the cab, increasing the risk of personal safety.

Correction: Install Cab Tilt System Upgrade Kit (#97019).

These services must be performed at a Spartan authorized service center, at no charge to you. The old solenoid is to be discarded.

What You Should Do Call an authorized service center without delay. **You do not need to call Spartan Motors, Inc.** Find the facility most convenient to you on the enclosed list of Spartan Motors' authorized service centers and call that facility to make an appointment to have this recall implemented.

Labor Time The labor time recommended for installing this kit is 3.5 hours to install this kit. However, due to some service scheduling times, your service center may need you vehicle for a longer period.

Reply Card Please fill out the enclosed prepaid postcard and mail it to us if you have changed your address or sold or traded the vehicle.

P.O. Box 440 · 1000 Reynolds Rd. · Charlotte, MI 48813 · U.S.A.
TELEPHONE 517-543-6400 · FAX 517-543-7727

If the authorized service center has failed or is unable to remedy the defect without charge and within a reasonable time, contact Spartan Motors at (800) 543-5008. You may also submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street SW, Washington, DC 20590 or call the Auto Safety Hotline at (800) 424-9393. (Washington DC area residents may call 202-355-0123)

We regret any inconvenience this service may cause you. Your safety and continued satisfaction with the quality and performance of your Spartan Motors Vehicle is of the utmost concern to us.

Spartan Motors

Chassis, Inc.

1000 Reynolds Road ♦ Charlotte MI 48813

RECALL SERVICE BULLETIN

SUBJECT:

Cab Tilt Solenoid Failure

This bulletin (#RSB 99V-010A) supercedes bulletin #RSB 99V-010 dated March, 1999. Any repairs completed under the direction of bulletin #RSB 99V-010 will be valid and will not require any further repairs for the condition stated. Publication of Bulletin #RSB 99V-010A addresses a part change which is represented by the addition of kit #97019A. Kit #97019 will continue to be a valid until the stock is depleted for part #0885-GG5-2SC004.

APPLIES TO:

Fire Trucks with Cab Tilt System: 1990-1997 Advantage, 1989-1997 Baron, 1987-1997 Charger, 1986-1997 Diamond, 1986-1997 Crash Truck, 1986-1996 Gladiator, 1991-1997 Metro Star.

CONDITION:

Unexpected Elevation of the Cab

CAUSE:

Cab Tilt System is Not Sufficiently Protected From the Elements

CORRECTION:

Install Cab Tilt System Upgrade Kit

SERVICE PROCEDURE:

Labor Time: 3.5 Hours

Install new ignition switch and cab tilt solenoid. Perform wiring rework as required.

PARTS LIST: (contents listed on attachment #CT-0001A)

QTY	Part Number	Description
1	97019	Kit- Cab Tilt Update w/Cable
	OR	
1	97019A	Kit- Cab Tilt Update w/Bus Bar

RECOMMENDED TOOLS:

1	8913440	Crimpers / Packard Tool
1	169400	AMP® Crimper w/ #169403 Die Set

Step by step instructions: Refer to FIG. 14-1

Due to the broad application of this bulletin, common kits have been assembled to satisfy several conditions. Please dispose of any unused parts and contact Spartan Motors Chassis, Inc. if there are deviations to the content described in this bulletin.

COMMON STEPS FOR THE NON-DDEC AND DDEC ENGINES

1. Chock wheels.
2. With the cab stationary (NOT tilted), disconnect the batteries.
3. Remove screws from the ignition panel, the main cluster, and from the park brake panel. The number of attachment screws may differ depending on design. Retain fasteners for re-installation.
4. Remove screw, lock washer, and paddle from the ignition switch and dispose of properly.
5. Pull out ignition/master switch panel to expose cable connections on the back of the ignition switch.
6. If the vehicle has a DDEC (Detroit Diesel Electronic Controlled) engine, proceed to step #27.

STEPS FOR THE NON-DDEC ENGINE

7. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one- (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

STEPS FOR THE NON-DDEC ENGINE (CONT.)

8. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: **Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 4-1); retain for re-installation.**

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

9. Refer to FIG. 4-1 to install new ignition switch. Locate star washer from the kit provided.

10. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: **Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.**

11. Secure nut on the front of the panel.

12. Obtain new paddle and lock washer from kit and **loosely** install on the new switch.

NOTE: **Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.**

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

13. Secure paddle in place by tightening screw/lock washer.

14. Remove the cable from the master switch that had previously been connected to the ignition switch. Dispose of properly.

STEPS FOR THE NON-DDEC ENGINE (CONT.)

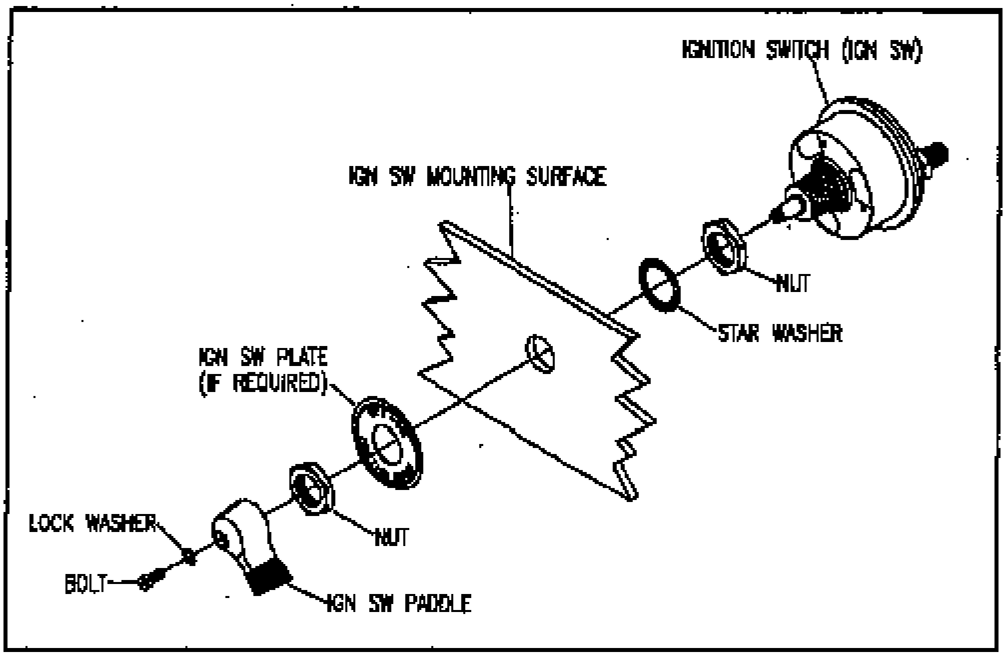


FIG. 4-1

15. Using the cable #0885-GG5-2SC004 (4.0" long) **OR** bus bar #1738-GG5, make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: If using the new 4.0" cable, it must be oriented in a "U" shape curving downward toward the floor.

15A) For Single Start Vehicles: Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

15B) For Dual Start Vehicles: Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

STEPS FOR THE NON-DDEC ENGINE (CONT.)

16. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

17. Locate the remaining wire(s) that were removed from the "old" ignition switch and install them to the #1 post of the new ignition switch.

18. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

19. Remove the left (driver's side) upper headlamp assembly.

20. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-2SL300), down through the headlamp opening until approximately 36" is left outside the hole.

21. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

22. Feed the loomed #379 circuit wire through the headlamp cutout until aproximately 36" is left out.

23. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

24. Connect circuit #63A cable to post #3 of the new ignition switch.

NOTE: This should be the only connections to post #3 of the ignition switch.

25. Tighten nut/lock washer on the #3 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

26. Proceed to step #64.

STEPS FOR THE DDEC ENGINE

RELAY BLOCK INSTALL (REFER TO FIG. 6-1)

27. Check the ignition switch for number and sizes of the posts. If the switch has **ONLY** 2- (two) 3/8" posts, return to step #7 and follow the "Non-DDEC" procedure.

28. Obtain relay/block sub-assembly from kit.

29. Remove relay and secondary lock from the block.

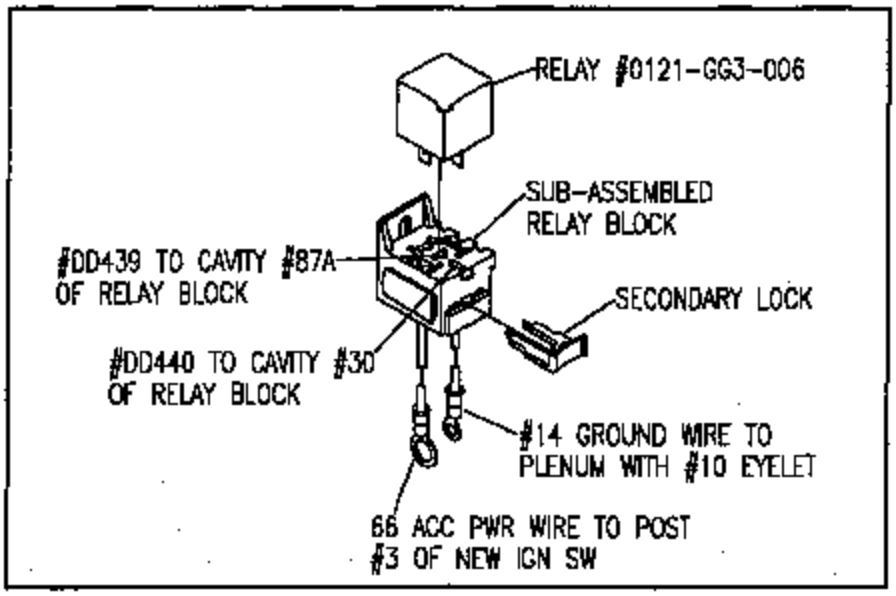


FIG. 6-1

30. Disconnect the #DD440 circuit from the back of the ignition switch.

31. Remove the ring terminal from the #DD440 circuit wire and crimp on female Packard terminal.

32. Insert the #DD440 circuit in cavity #30 of the relay block.

STEPS FOR THE DDEC ENGINE

33. Disconnect the #DD439 circuit from the back of the ignition switch.

34. Remove ring terminal from the #DD439 circuit wire and crimp on female Packard terminal.

35. Insert the #DD439 circuit in cavity #87A of the relay block.

36. Snap white secondary lock back into the relay block.

37. Using a 9/16" wrench, remove nuts, washers, and wires/cables from the posts on the back of the ignition switch.

NOTE: Depending on options, there may be more than one- (1) wire per post. Ensure the connections from each post that are grouped together remain together. Use a tie strap to group the circuits prior to disconnecting them from the posts.

38. Remove hold down nut from the front of the ignition switch and push switch through the panel.

NOTE: Older models may have a metal plate to designate the "ON" and "OFF" positions for the ignition switch (refer to FIG. 4-1); retain for re-installation.

Some models may also have a fiberglass cluster housing that can easily be cracked. Care should be taken when removing and re-installing the panel.

39. Refer to FIG. 4-1 to install new ignition switch. Locate star washer from the kit provided.

40. Install new ignition switch to the panel ensuring that the panel is captured between the star washer (back of panel) and the large nut (front of panel).

NOTE: Locate/install switch in panel with the #2 post positioned at the bottom, and the #1 and #3 posts at the top.

STEPS FOR THE DDEC ENGINE (CONT.)

41. Secure nut on the front of the panel.

42. Obtain new paddle and lock washer from kit and **loosely** install on the new switch.

NOTE: Verify the paddle orientation by ensuring the paddle flips to the "OFF" position and to the "ON" position.

An adjustment to the switch may be necessary by loosening the nut on the front of the panel and adjusting as needed. Re-verify paddle movement as previously described.

43. Secure paddle in place by tightening screw/lock washer.

44. Remove the cable from the master switch that had previously connected the ignition switch to the master switch (old circuit #63). Dispose of properly.

45. Using the cable #0885-GG5-2SC004 (4.0" long) OR bus bar #1738-GG5, make a connection between the master switch (post without the #62 circuit to the battery) and the #2 post of the new ignition switch completing circuit #63.

NOTE: If using the new 4.0" cable, it must be oriented in a "U" shape curving downward toward the floor.

43A) **For Single Start Vehicles:** Re-connect all circuit options that were connected with the jumper at the old ignition switch to post #2 of the new ignition switch.

43B) **For Dual Start Vehicles:** Circuits #62 and #63 (including all other circuit options connected with these) will need to be connected to post #2 of the new ignition switch.

46. Tighten nut/lock washer on the # 2 ignition switch post with a 9/16" wrench.

STEPS FOR THE DDEC ENGINE (CONT.)

47. Locate the remaining wire(s) that were removed from the "old" ignition switch (includes circuit #66) and install them to the #1 post of the new ignition switch.

48. Tighten nut/lock washer on the #1 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

AT THE CAB EXTERIOR

49. Remove the left (driver's side) upper headlamp assembly.

50. Feed the 5/16" eyelet end of the new circuit #63A (300" red battery cable, #0885-GG5-2SL300), down through the headlamp opening until approximately 36" is left outside the hole.

51. Obtain the 300", circuit #379 wire (#0940-GG5-379, 14 ga.) from the kit and loom.

52. Feed the loomed #379 circuit wire through the headlamp cutout until approximately 36" is left out.

53. Feed the remaining 36" ends for both the #379 and #63A circuits up through the grommet and into the relay area.

AT THE PLENUM/DASH

54. Feed relay block through the ignition panel opening.

55. Locate an area approximately 2.0" X 2.0" for mounting the relay block within reach of the wire length supplied.

56. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

57. Utilizing the pilot hole, mount the relay block with a self-tapping screw.

STEPS FOR THE DDEC ENGINE (CONT.)

58. Install the relay into the mounted relay block and re-install secondary lock.

59. Prepare a .50" area on the plenum for mounting the eyelet by removing all paint around the location for mounting the ground eyelet.

NOTE: Eyelet mounting must be located within 24.0" of relay.

60. Drill a #18 (.169) pilot hole to accept the self-tapping screw provided.

61. Secure the #10 eyelet, at the end of circuit #14, with a self-tapping screw in the new pilot hole.

62. Connect circuit #63A cable, and the 3/8" eyelet of circuit #66 wire from the relay block, to post #3 of the new ignition switch.

NOTE: These 2 (two) should be the only connections to post #3 of the ignition switch.

63. Tighten nut/lock washer on the #3 ignition switch post using a 9/16" wrench.

NOTE: Verify that there are no wires touching more than one post. Failure to do so may result in incorrect operation.

COMMON STEPS FOR THE NON-DDEC AND DDEC ENGINES (CONT.)

64. Crimp male Packard terminal on cab end of circuit #379.

65. Snap on male Packard connector.

66. Snap on female end of diode to the male end of the #379 circuit.

67. Connect eyelet end of diode to the park brake switch located on the back of the park brake.

NOTE: If the park brake switch is a two-post design, add the connection to the "N/C" position identified on the back of the switch. A single-post switch will require attachment to the single post.

COMMON STEPS FOR THE NON-DDEC AND DDEC ENGINES (CONT.)

68. Re-install the ignition panel, park brake panel, and main gauge panel using the original hardware.

69. Turn the master switch to the "OFF" position.

> **CAUTION:** Failure to place the master switch in the "OFF" position could cause shorts and/or sparks.

70. Replace headlamp module.

71. Re-connect batteries.

72. Tilt cab and ensure the cylinder support is in place prior to continuing.

AT THE CHASSIS

73. Route the circuit #379 wire and the circuit #63A cable around the pivot point and along the chassis following the existing harness(es).

NOTE: Secure with the 15" tie straps approximately every 24" until the lock downs are reached.

74. Follow the 3/O cable from the existing tilt solenoid back to the battery and disconnect from the battery.

75. Verify that the tilt function is disconnected by pressing the tilt control in lift position. Disconnect battery cable to the tilt solenoid if not already done. Repeat verification to ensure the tilt function is disabled.

76. Replace battery nut previously removed.

77. Disconnect and remove battery cable at the tilt solenoid. Dispose of cable properly.

78. Route circuit #63A cable under cab lock-down, following the path of the old cable to the pump solenoid.

COMMON DDEC/NON-DDEC PROCEDURES CONTINUED

79. Remove copper bar, white wire, yellow wire, and brown wire from the existing solenoid. Retain nut, from the removal of the copper bar, for re-installation.

80. Remove existing solenoid and dispose of properly. Retain screws for re-installation.

81. Using a mounting screw, connect yellow wire and white #14 ground wire to one side of the solenoid mount and attach the assembly to the pump using existing mounting hole.

NOTE: The #14 white wire may not be present on some older models.

82. Attach the remaining mount to the pump with a mounting screw.

83. Attach the brown wire on either of the small posts of the solenoid.

84. Cut the #379 circuit wire to an appropriate length.

85. Crimp eyelet on to the #379 circuit (using AMP® approved crimpers).

86. Attach #379 circuit to the second of the two small posts on the solenoid (the one not occupied by the brown wire).

87. Secure #379 circuit in place with 7" tie straps as needed.

88. Check the circuit #63A cable for the appropriate length to attach to either of the large solenoid posts.

NOTE: If the cable is too long, loop excess into frame rail ensuring the cable does not come into contact with the main driveshaft, the PTO driveshaft, or contact any other potential chaffing surfaces/edges.

89. Secure cable in frame rail using 15" straps.

90. Connect the circuit #63A cable to either of the large posts on the solenoid.

COMMON DDEC/NON-DDEC PROCEDURES CONTINUED

91. Connect 12.0" battery cable #0885-GG5-2RC012 to the unoccupied large post on the solenoid.

92. Connect the loose end of the 12.0" battery cable to the power post of the tilt motor (where copper bar was previously connected).

93. To prevent undesired contact of cables/wires to other components, confirm that none of the new components exceed the height of the pump reservoir. Re-routing will be necessary if this condition exists.

94. Spray all pump terminals with terminal corrosion protector such as Krylon 1308 or equivalent.

95. Lift and release cylinder support to lower cab.

TEST PROPER FUNCTION OF CAB TILT SYSTEM

96. Ensure the park brake is set, cab is empty of all occupants, and the ignition AND master switches are in the "OFF" position. Attempt to tilt the cab using the tilt control. The cab tilt should NOT operate.

97. Ensure the park brake is set, cab is empty of all occupants, the ignition switch is in the "OFF" position, and the master switch is in the "ON" position. Attempt to tilt the cab using the tilt control. The cab tilt should operate.

98. Ensure the park brake is set, cab is empty of all occupants, and the master and ignition switches are in the "ON" positions. Initiate the cab tilt function to raise the cab. The cab should NOT raise, but can be lowered.

99. Ensure wheels are chocked. Repeat steps #91, #92, #93 with the park brake released. The cab tilt system should NOT function under any of these conditions.

100. If all tests are successful, this procedure is completed. If any of the tests fail, return to step #1 and repeat the repair procedure.

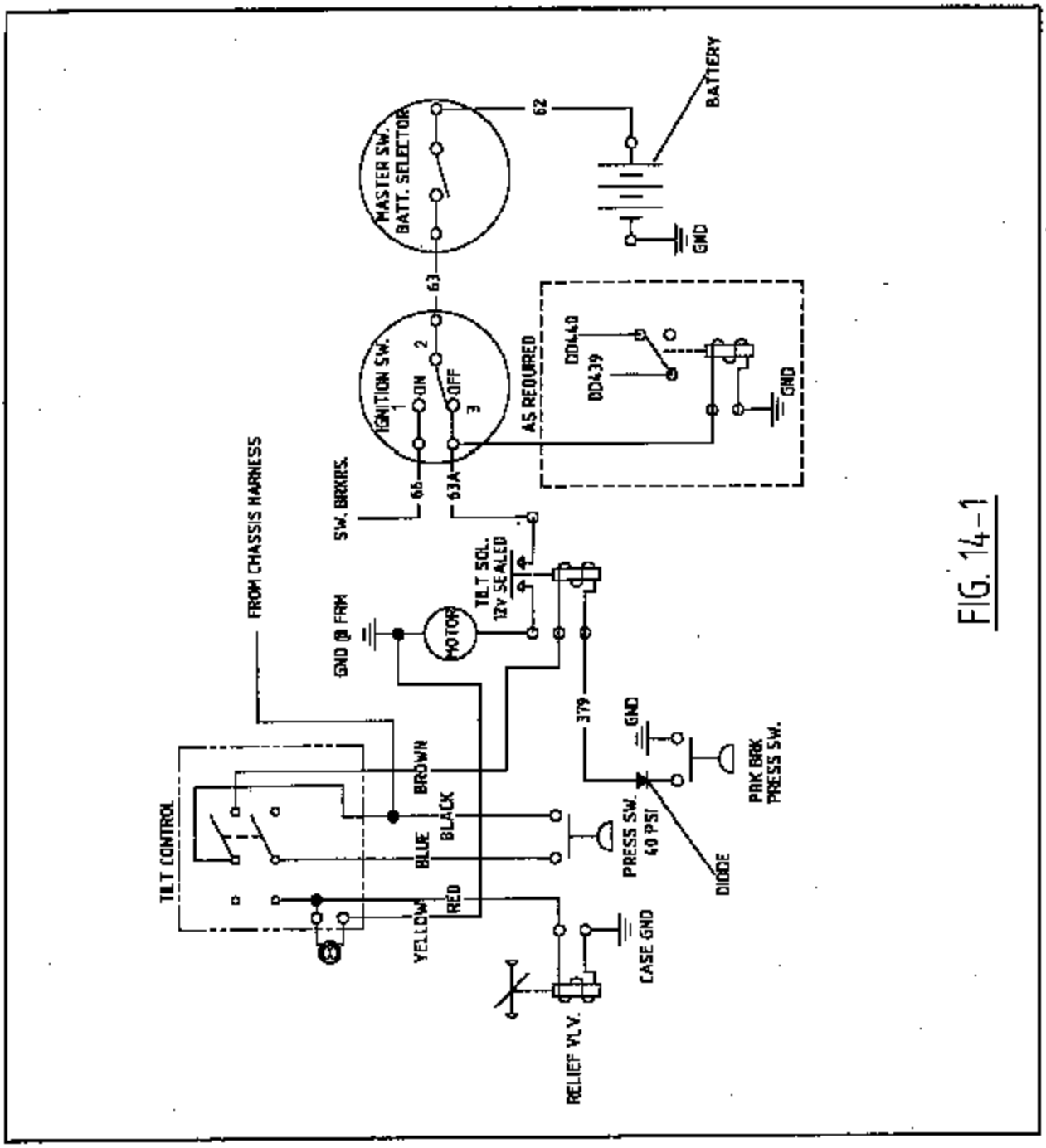


FIG. 14-1

RSB99-V-0010A CAB TIL SOLENOID FAILURE
(SPEC #97019A)

PARTS LIST				KIT #97019	KIT #97019A
PART #	PART DESC.	QTY.	Illustration Reference / Comments	W / CABLE	W / BUS BAR
			Relay Block Assembly		
12033871	Connector Block- F 5-way	1	Pre-Assemble at Spartan Motors	X	X
0636-GG5-A20	Eyelet- 3/8"	1	See Page 2- Sub-Assembly of Relay Block	X	X
0636-GG5-A05	Eyelet- #10	1		X	X
0940-GG5-014	Wire- 14 Ground (14awg) (2 feet)	2		X	X
0940-GG5-66S	Wire- 66 Acc Pwr (14 awg) (2 feet)	2		X	X
0636-GG5-B21	Terminal	2		X	X
0121-GG3-006	Relay- 12 volt, 40/30 Amp	1		X	X
12033872	Secondary Lock	1		X	X
10240050HWTCFZ	Self-tapping Screws	2		X	X
0134-GG3-024	Switch-Ignition	1	*LOCATING NUB GROUND OFF AT SPARTAN*	X	X
0885-GG5-2SL300	Cable- Ignition Switch to Tilt Solenoid	1	300 inches in length	X	X
0185-GG3-013	Solenoid-Cab Tilt	1		X	X
0885-GG5-2RC012	Cable-Tilt Solenoid to Pump	1		X	X
0885-GG5-2SC004	Cable- Master Switch to Ignition	1		X	
1738-665	Bus Bar- Master Sw to Ign Sw	1			X
0636-GG5-B21	Terminal	2		X	X
0636-GG5-A05	Eyelet- #10	1		X	X
T120RO	Tie Straps- 15"	15		X	X
T3ORO	Tie Straps- 6"	7		X	X
0940-GG5-379	Wire- 14 awg "park brake"	25	300 inches in length	X	X
0636-GG5-J06	3/8" Loom	25	25 feet in length	X	X
8900420	Male Connector	1		X	X
0636-GG5-D02	Male Terminal	1		X	X
0172-GG3-005	Diode	1		X	X
99V-010	Bulletin Instructions	1		X	X
CT-0001	Part List	1		X	X

SUB-ASSEMBLY OF RELAY BLOCK
TO BE COMPLETED AT SPARTAN MOTORS